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Exploring the Hydration Levels of Malosma laurina at Different Elevations on a Man-made Trail

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Abstract

The purpose of this study is to examine the water potential of *Malosma laurina* at different elevations of a man made trail in the chapparal of the Santa Monica Mountains. Chaparral in the Santa Monica Mountains have been depleted because of human involvement effecting the chaparral ecosystem. Fire breaks and man made trails are a few of the major causes of the rapidly changing ecosystem and continues to cause stress among the plants. We are testing the effect that man made trails have on the water potential of *Malosma laurina.* This was measured by taking samples of *Malosma laurina* at different altitudes of the trail. Collecting samples and measuring the water potentials of *Malosma laurina* at different regions led to conclusions about which *Malosma laurina* plants have the most, least water potential.

Malosma laurina plant middle of the trail

Introduction

Man-made trails have a negative effect on the water hydration of *Malosma laurina*. The water hydration is higher in *Malosma laurina* plants at the bottom of the hill than those at the top of the hill. This is going to be measured by taking *Malosma laurina* leaves at the top of the hill, middle of the hill, and the bottom of the hill. In addition, data will also be collected 50 feet away from the trail as a basis of comparison to the *Malosma laurina* plants on the trail, in order to see if there is any significant difference in water hydration. These samples will then be put into the pressure chamber and the results will be recorded.

The *Malosma laurina* are an integral part of the chaparral in the Santa Monica Mountains. Many man-made trails are negatively affecting the survival rate of this species, especially those located on the higher elevations of these trails. The plants at higher elevations are not receiving the same amounts of water due to the way the water flows down the slopes.

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Results

Samples	Water Potential (bars)
1 (bottom of trail)	7.0
2 (bottom of trail)	8.2
3 (bottom of trail)	4.4
4 (top of tail)	9.4
5 (top of trail)	8.0
6 (top of trail)	8.0

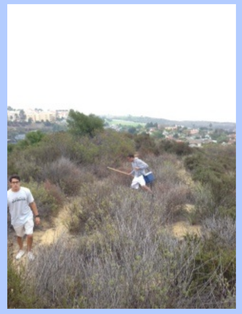
Samples	Water Potential (bars)
1 (bottom of trail)	9.8
2 (middle of trail)	17.1
2 (middle of trail)	19.6
3 (top of trail)	15.8
3 (top of trail)	20.6

Methods

We conducted our research by going to the trail and collecting samples of Malosma laurina at the top, middle, bottom, of the trail. We then got samples that were 50 feet from these points. Pruning sheers, pink tape, plastic bags, and an ice chest were used to collect our specimens, which were individual leaves of the *Malosma laurina* plants. Once we got back to the lab, the bark on each of the leaves was peeled off in order to get proper results. The gas pressure chamber was used to measure the water potential of our leaves and we recorded these results. Our experiment approach is capable of properly testing our hypothesis and it can be repeated. The data was correctly analyzed in our experiment.

Discussion

The results prove that the plants at the bottom of the trail are more hydrated than those at the top. The water flow down the trail has the greatest effect on the hydration of the plants. Some of our results were not expected such as the samples that we took 50 feet away from the trail. The plants at the top of the trail were not well hydrated mainly due to the flow of water as well as their increased distance away from the water table. The plants in the middle of the trail (50 feet away) were the least hydrated of all the samples mainly because the chaparral is the most dense in this area which means there is a lot of competition.



Eric and Brandon on top of trail

Study Site top of trail

Conclusion

From the data, the results support our hypothesis that the *Malosma laurina* plants at the bottom of the trail were more hydrated than those at the top of the trail. The plants at the bottom of the trail are closer to the water table than those at the top. They also receive more water because it flows down the trail. The *Malosma laurina* away from the trail had to compete for water from surrounding plants resulting in less hydration.

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